

REMARKS

Claims 4-9, 12-16 and 23-36 are pending in the application. With this amendment, claims 8 and 29 have been cancelled.

The only issues remaining in the application are whether claims 4-7, 9, 12-16, 23-28, and 30-36 are anticipated by Davenport, U. S. Patent No. 3,652,733 or Henkel KgaA, German Patent Application No. DE 32 47 736 under 35 U.S.C. §102(b). Regarding Davenport, the Examiner states that a composition is disclosed containing PVC, ethylene glycol bis(beta-mercaptopropionate), with the composition optionally including metal stabilizers.

The Davenport reference discloses polythiols in column 2, lines 25-46. Davenport's polythiols are esters of thioglycollic acid or mercaptopropionic acid with polyhydroxy compounds having 2 to 6 hydroxyl groups. Thus, Davenport's polythiols can only teach Applicants' Compound II presented in claim 4 when x is 2, y is 1, z is 0 and R⁴ is 1 or 2. Accordingly, in order to have this reference removed, Applicant has amended independent claim 4 as well as corresponding independent claim 25 to state that in Compound II when z is 0 and y is 1, R⁴ is an alkyl having from 3 to 20 carbon atoms. The remaining dependent claims have been amended in a similar manner to remove any teaching or suggestion of the Davenport reference. Thus, the Davenport reference cannot teach or suggest the organic thiols as currently claimed by the present invention. Moreover, one of ordinary skill in the art would have no motivation to utilize Davenport's polythiols solely as a heat stabilizer component for chlorine or bromine containing polymers. Davenport can only teach or suggest utilizing the polythiol as a curative in combination with a polymerizable plasticizer to produce thiol ether links as stated in column 1, line 53-60.

The Henkel reference has been cited by the Examiner as teaching Applicants' compositions of a halogen-containing polymer and an organic thiol heat stabilizing component. The Examiner has placed reliance on claim 1 of the Henkel reference

wherein it is stated that poly(vinyl chloride) molding compounds contain at least one compound of the organic thiol shown. The organic thiol illustrated by Formula I of the Henkel reference only contains 4 carbon atoms in the central portion thereof with 2 of the carbon atoms each being a part of ester groups.

As argued in the previous rejection, Applicant maintains his position that Henkel can only teach a combination of a metal-containing stabilizer along with the organic thiol in the presence of PVC. On page 15 of the translation, second full paragraph Henkel states:

"In the simplest scenario, the stabilizer combination for polyvinyl chloride molding compounds in accordance with the invention is comprised of a primary stabilizer which is selected from the group which consists of metal soaps, aromatic metal carboxylates, and metal phenolates, and a compound of Formula I or II."

However, in order to have the application allowed and proceed to issuance, the independent claims of the present invention have been amended to overcome the Henkel reference. Independent claim 4 has been amended to state that in Compound I when y is 0 and z is 1, R³ is an alkyl having from 3 to 20 carbon atoms. As such, the internal portion of the organic thiol compound between the ester groups must have a minimum of at least 5 carbon atoms. The Henkel reference teaches or suggests the same linkage having only 4 carbon atoms total. Thus, Henkel cannot teach or suggest independent claim 4.

Independent claim 25 has been amended in a manner consistent with independent claim 4. Thus, the Henkel reference is no longer pertinent to the claims of the present invention.

A Supplemental Information Disclosure Statement is being submitted concurrently with this amendment. The Supplemental Information Disclosure Statement includes search results from a related international application. As a convenience to the Examiner, the Applicant offers the following explanations as to

why the references in the Search Report are not pertinent to the claims of the present invention presented within this amendment.

The EP 0 945 484 reference can only teach a synergistic blend of a metal-based stabilizer or Lewis acid and a free mercaptan for enhanced PVC stabilization, see Title and Abstract. This reference has already been considered by the Examiner in Form PTO-1449 signed April 17, 2003 by the Examiner.

Independent claim 4 consists of a heat stabilizer of an organic thiol and optionally epoxidized soybean oil and thus excludes metal-based stabilizers and/or Lewis acids. Independent claim 25 is free of metal-based stabilizers and Lewis acids.

Hechenbleikner, U. S. Patent No. 3,167,527 relates to the preparation of halogen containing resins containing tin compounds as stabilizers therefore, see column 1, lines 11-13. A metal-based stabilizer tin compound is used in an amount from 0.01 to 10 percent by weight of the resin and is thus excluded by all claims of the present invention as described above, see column 2, lines 20-26. Moreover, in column 1, lines 34-37 Hechenbleikner states that "the use of the mixture of the tin compound and nontin containing sulfur compound exerts a synergistic stabilizing action which could not be foretold from the use of either of the compounds alone."

Kornbaum, U. S. Patent No. 4,412,897 concerns the stabilization of halogen polymers and incorporates hydroquinone, a metallic compound, heat stabilizer and mercaptan, see Abstract. In column 3, lines 3-8, the organo-metallic stabilizer is used in amounts from 0.01 to 5 percent by weight of the resin and preferably from 0.5 to 2.5 percent. Thus, Kornbaum's embodiments are not taught or suggested by the claims of the present invention which by definition exclude metal-containing stabilizers. The Kornbaum '897 reference was considered and cited by the Examiner in the Office Action mailed 4/21/03.

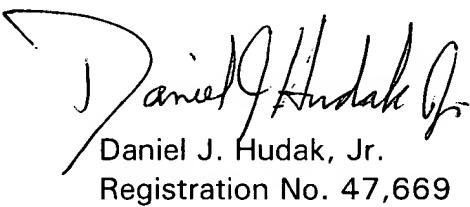
Kornbaum, U. S. Patent No. 4,616,046 is similar to the previous Kornbaum reference and sterilizes halogen containing polymers utilizing a standard stabilizer such as an organo-tin and/or organo-antimony and one or more esters bearing a mercaptan function, see column 2, lines 20-30. In column 5, lines 10-14 it is stated that the metallic stabilizer is used in the same amounts as stated above for the other Kornbaum reference. Accordingly, the Kornbaum reference cannot teach or suggest Applicants' claims, which by definition, exclude the Kornbaum metal-based stabilizers. The Kornbaum '046 reference was considered and cited by the Examiner in the Office Action mailed 4/21/03.

Finally, JP reference 01090167 teaches the formation of a polythiol compound prepared by reaction of an alcohol or a thiol in a thioglycolic acid or mercaptopropionic acid. There is no teaching or suggestion for utilizing the polythiol in a polyvinyl chloride composition. The claims of the present invention are neither anticipated nor taught or suggested by the JP reference.

It is respectfully submitted that the claims are in condition for allowance and a notice of such is earnestly solicited.

Respectfully submitted,

HUDAK, SHUNK & FARINE CO. LPA



Daniel J. Hudak, Jr.
Registration No. 47,669

2020 Front Street, Suite 307
Cuyahoga Falls, OH 44221
Telephone 330-535-2220

Attorney Docket No.: EP-1020-CIP